

501.36931X00

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicants: T. IWASAKI, et al.  
Serial No.: 09/255,856  
Filed: February 23, 1999  
Title: SEMICONDUCTOR DEVICE WITH LAYERED  
INTERCONNECT STRUCTURE  
Group/AU: 2813  
Examiner: Stephen W. Smoot  
Confirmation No.: 9089

**INFORMATION DISCLOSURE STATEMENT  
UNDER 37 CFR 1.97 AND 1.98**

**Mail Stop: RCE**  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

June 23, 2005

SIR:

Pursuant to Applicants' duty of disclosure, enclosed please find copies of documents to be considered by the Examiner during further examination of the above-identified application. Also enclosed is a Form PTO/SB/08A and B, listing the enclosed documents.

This Information Disclosure Statement is being filed concurrently with the filing of a Request for Continued Examination (RCE) Transmittal in the above-identified application. Accordingly, requirements of 37 CFR 1.97(b) are satisfied.

While the documents LISTED on the enclosed Form are not in English, English-language abstracts for each of the respective documents are enclosed therewith. Accordingly, it is respectfully submitted that requirements of 37 CFR 1.98(a)(3) are satisfied.

In addition, the following comments are made in connection with the enclosed Japanese Patent Document No. 6-236878. As set forth in the English-language patent abstract thereof, No. 6-236878 discloses interposing a barrier layer 43b at a joint between a first copper wiring 41 and a second aluminum alloy wiring 51. Palladium (Pd) is disclosed as this barrier layer. Attention is respectfully directed to paragraph [0026] on page 541 of No. 6-236878. This paragraph discloses that Pd can be replaced by Pt, Ru, or Rh, for layer 51a, between layer 51 (Cu) and 50 (insulator; silicon dioxide). This patent document discloses use of Pt and Ru, etc., as a barrier layer to avoid electromigration.

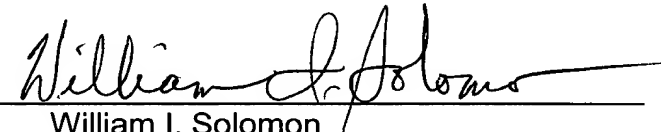
Attention is also directed to paragraph [0030] of No. 6-236878, on page 542, disclosing that the barrier layer can be formed by techniques such as sputtering, PVD and CVD.

A full English translation of Japanese Patent Document No. 6-236878 is to be submitted in due course. If this full English translation is not in the file of the above-identified application as of the date that the Examiner takes up the above-identified application for further examination, the Examiner is respectfully requested to contact the undersigned, to determine the status of such full English translation. The Examiner is thanked in advance for cooperating with this request.

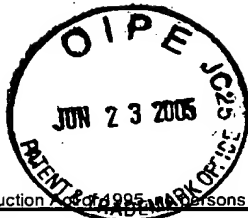
Consideration of the documents listed on the enclosed Form, upon further examination of the above-identified application, is respectfully requested.

Applicants request any shortage of fees due in connection with the filing of this paper be charged to the Deposit Account of Antonelli, Terry, Stout & Kraus, LLP, Deposit Account No. 01-2135 (case 501.36931X00), and credit any excess fees to such Deposit Account.

Respectfully submitted,  
ANTONELLI, TERRY, STOUT & KRAUS, LLP.

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PTO/SB/08A (08-03)

Approved for use through 07/31/2006. OMB 0651-0031

U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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| <b>INFORMATION DISCLOSURE STATEMENT<br/>BY APPLICANT</b><br><br><b>June 23, 2005</b><br><br>(use as many sheets as necessary) |   |    | <b>Complete if Known</b> |                        |              |
|   |   |    | Application Number       | 09255,856              |              |
|   |   |    | Filing Date              | 02/23/1999             |              |
|   |   |    | First Named Inventor     | T. IWASAKI             |              |
|   |   |    | Art Unit                 | 2813                   |              |
|   |   |    | Examiner Name            | Stephen W. Smoot       |              |
| Sheet   | 1 | of | 1                        | Attorney Docket Number | 501.36931X00 |

| U.S. PATENT DOCUMENTS             |                          |  |  |                                |  |   |
|-----------------------------------|--------------------------|--|--|--------------------------------|--|---|
| Examiner<br>Initials <sup>1</sup> | Cite<br>No. <sup>1</sup> | Document Number                          |  | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines, Where<br>Relevant Passages or Relevant<br>Figures Appear |
|                                   |                          | Number-Kind Code <sup>2</sup> (if known) |  |                                |  |   |
|                                   |                          | US-                                      |  |                                |  |   |
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|                                   |                          | US-                                      |  |                                |  |   |

| FOREIGN PATENT DOCUMENTS          |                          |   |                                |  |   |                |
|-----------------------------------|--------------------------|---|--------------------------------|--|---|----------------|
| Examiner<br>Initials <sup>1</sup> | Cite<br>No. <sup>1</sup> | Foreign Patent Document   | Publication Date<br>MM-DD-YYYY | Name of Patentee or<br>Applicant of Cited Document | Pages, Columns, Lines,<br>Where Relevant Passages<br>or Relevant Figures Appear | T <sup>6</sup> |
|                                   |                          | Country Code <sup>3</sup> -Number <sup>4</sup> -Kind Code <sup>5</sup> (if known) |                                |  |   |                |
|                                   |                          | JP 06-236878  | 08/1994                        | H. Kondo, et al.                                   |   | A              |
|                                   |                          | JP 10-256251  | 09/1998                        | N. Awaya, et al.                                   |   | A              |
|                                   |                          | JP 05-315336  | 11/1993                        | I. Mikagi  |   | A              |
|                                   |                          | JP 09-069522  | 03/1997                        | S. Okamoto   |   | A              |
|                                   |                          | JP 10-284601  | 10/1998                        | M. Omura   |   | A              |
|                                   |                          | JP 10-022274  | 01/1998                        | Y. Ashida  |   | A              |
|                                   |                          | JP 2001-505367  | 04/2001                        |  | Machine translation<br>only   |                |
|                                   |                          |   |                                |  |   |                |

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|-----------------------|--|--------------------|--|
| Examiner<br>Signature |  | Date<br>Considered |  |
|-----------------------|--|--------------------|--|

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional). 2 See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. 3 Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). 4 For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. 5 Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. 6 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.